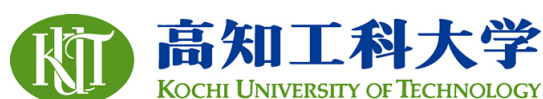


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# METHOD OF EVALUATING THE FEELING OF BURDEN EXPERIENCED BY CAREGIVERS: FROM CONCEPT OF SYSTEM MAINTENANCE

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**ABSTRACT:** The purpose of this study is to find out the methodology in the decision making that the local government should execute the policy which is population's effect becomes the maximum. The administrative management system is proposed as a system that considers the environment. We proposed the method of the decision making based on the NPM in the waste administration. We are examining it in the nursing care insurance now. This paper proposes the method of evaluating the nursing insurance service from the side of the main caregivers. The main caregiver uses the nursing insurance service to reduce the burden of nursing. It doesn't have the feeling of burden by caregivers, if the main caregiver is using the nursing insurance service corresponding to the cause of the nursing burden. I classified the element of the feeling of burden by caregivers through the hearing investigation. The classification of this nursing burden was considered to be able to understand the potential needs the main caregiver's. Here, the problem structuring can make a reasonable logical model. The strategic target of the logic model in this paper is reduction of nursing burden. The logic model can logically show the relation between the outcome and the output. This research proposes the method of deciding the measure. The method to propose by this research has the function of the system maintenance. The systems that get by this method can be used for the review corresponding to the management cycle.

**KEYWORDS:** NPM, system maintenance, the feeling of burden by caregivers

## 1. INTRODUCTION

### 1.1 Background of the research

Public service is provided by the tax and insurance from the people. As for the administration, the operation of the efficient capital is being requested by the people. Therefore, it is important that the administration offer the people an appropriate content of service and the amount of service. We did the introduction research on New Public Management (NPM) in the local government. We investigated the decision making process when the administration did the service offer in the research. However, the administration has not made an

examination of the policy in advance. It is not done about not only it but also the analysis of effect by the policy.

For example, I state "compost making of garbage" that is one of the "reduction of waste" measures. The population will request the collection and the use of compost to the administration, so that the population may cooperate in making to compost with the house. The use of compost was difficult at home because of the change in the house form such as housing complexes. The administration should correspond to the change in population's life environment. Nevertheless, the administration doesn't have the

system (decision making process) to correspond to the population's environmental change. In addition, the administration doesn't understand the effect (amount of the burnable waste reduction) of spread the garbage disposal. The decision making process such as to confirm the effectiveness of the policy and to propose the improvement of it is insufficient in the administration. The method of designing the system maintenance has not been necessarily established in the administration. The concept of the system maintenance is necessary in the administration. Because the administration necessary to know whether the provided service is appropriate. The combination of measures to achieve the target efficiently is not examined in the decision making process of the administration now. Moreover, the administration doesn't have a concrete strategic target. It is an actual condition that the effectiveness of the investment is not quantitatively appreciable.

Then, it proposes the design and the business skill of the management system that adds a technological viewpoint in this research. This is necessary to manage efficient in the administration. A technological viewpoint is to keep quantitative. For example, it is an evaluation function of the social benefit (effect) that the population receives by service. First of all, the effect and the cost of an individual policy are quantified. And, the budget allotment as the entire administration can be understood by organically evaluating as each policy. In a word, the selection of an efficient, effective policy can be done to the target. The evaluation function obtained by a technological finding is used as a criterion of the decision making. This research applies the idea of the decision making to the nursing insurance system. The nursing insurance system is one of the social securities. Cost of Social Security is large in the budget of the local government.

## **1.2 Purpose of the research**

The purpose of this research is a methodology of the decision making that does the policy selection that population's effect becomes the maximum in the limited budget. The nursing insurance system aims at rich aging society by achieving the following two.

1. The patient's independence is supported.
2. Nursing by the family makes established partially of the society.

The patient's independence and caregiver's reduction of incidence are obtained to this system in the limited resource. It is necessary to achieve this system in the limited resource to the patient's independence and caregiver's reduction of incidence. It is important that the administration provide the nursing service that user's effect becomes the maximum.

The amount of use and the number of users of nursing service increase well after enforcing the nursing insurance system. Nursing is established as the mechanism of the society. The family nursing is 80 percent or more given even after execution of the system. Even if the nursing service is used, the family's nursing is necessary. How much nursing insurance system led to the supplementation with nursing by the family? This answer is to understand how nursing was established to the mechanism in the society. The evaluation method is whether the family caregiver uses the nursing service, and how much burden of nursing has been reduced. First, we investigate the burden of nursing that individual caregivers are holding. In this paper, the caregivers are a person who is nursing the patient (certification for long-term care person) by staying at home.

## **2. ANALYSIS OF NURSING INSURANCE SYSTEM**

This chapter analyzes the problem of the nursing

insurance system.

## 2.1 Nursing insurance system

The number of certification for long-term care people have 1.6 times after the system starts (Figure 1) Paying attention in Figure 1 is a remarkable increase of a slight number of certification for long-term care people. Figure 2 shows the transition of the nursing supply expense of the average for one month. The expansion of the nursing supply expense of the house service is larger than the supply of the facilities service. An increase in the nursing supply expense is an increase of the house service by an increase of a slight certification for long-term care person. The number of senior citizens who need nursing will keep increasing in the future. It has misgivings about not only the caregiver's burden increase but also the tenability of the nursing insurance system. The nursing insurance system is a health system that the people equally pay. This system has been managed by the insurance 90 percent and the user weight 10 percent. Therefore, an increase of the user means the people's burdens.

On the other hand, the foundation of the nursing insurance system is called proceeding of decentralization. The local government who is the insurance person decides the insurance. The local government reviews the system management every three years. Insurance is set from the system of offer and the amount of the expectation of service. The setting of insurance can be decided in each local government. However, the nursing service has been strictly decided by the country. Therefore, the local government cannot originally judge it. The content of the plan reviewed every three years is an amount of the expectation of service and an estimate value of the nursing supply expense. There is no policy that senior citizen doesn't enter state of nursing necessary in the plan. The plan from the image of the future is

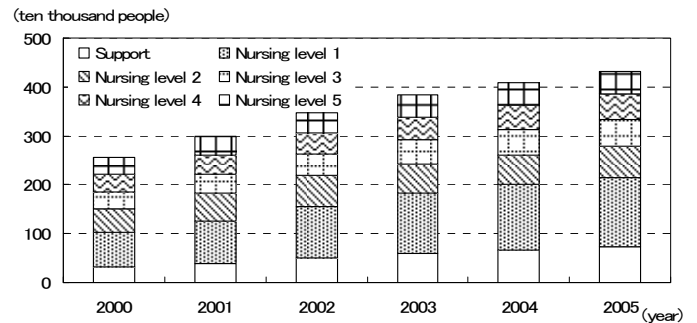


Figure1. The certification for long-term care person's transition

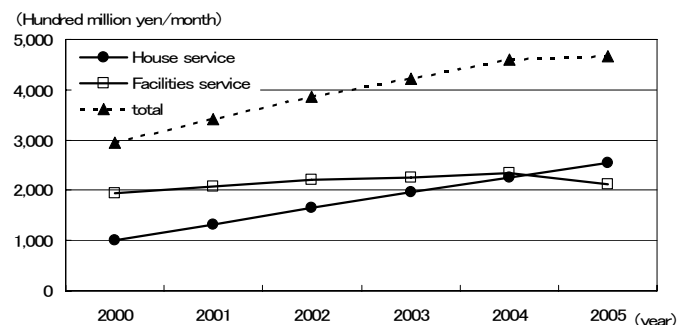


Figure2. Transition of nursing supply expense

not done.

## 2.2 Problem of nursing insurance system

The service offer entrepreneur provides uniform service and a uniform reward is paid. The country has uniformly decided service and the charge. Therefore, the market mechanism doesn't function in the nursing insurance system. The cost reduction of the service offer entrepreneur is not related to the price decrease. Moreover, providing service by a uniform charge becomes deterioration of finance for the local government. The nursing insurance system has stiffened according to uniform service and a uniform charge. The local government cannot devise the method for raising efficiency. And, there is no system that refunds insurance. If he or she doesn't receive service, the people become disadvantageous. But then, there is a case where it is necessary to depend on the family's nursing because the payment of 10 percent is difficult. Uniform service has the

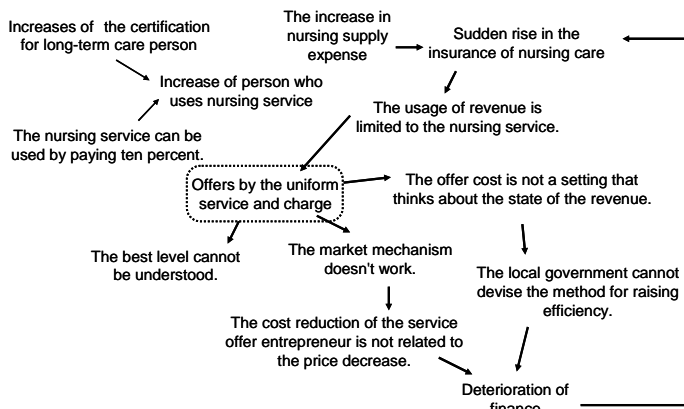


Figure3. Problem of nursing insurance system

case where the nursing of the family doesn't substitute easily. The uniform serving the uniform charge is a source of the vicious circle of the nursing insurance system. The uniform serving and the charge is can not discuss a reform in the local government. Figure 3 is a structure of the problem of the nursing insurance system.

### 3. STRUCTURIZING OF PROBLEM

#### 3.1 Problem structuring of senior population's welfare policy

The author described that the nursing service does not fit the population's needs because the nursing insurance system was uniform service and a uniform charge in the preceding chapter. It was described that it was the local government cannot devise oneself. The purpose of this research is a methodology of the decision making that does the policy selection that population's effect becomes the maximum in the limited budget. The method of the decision making has OR (Operations Research) to teach the manager the optimal solution for the problem. OR keep the decision making as a mathematical problem. It supports the decision making by a scientific approach. The optimal solution to achieve the purpose is requested by a mathematical method. The optimal solution is answered in the environment that



Figure4. Problem of nursing insurance system

doesn't change. The problem solving by OR is composed of the structure of established system. However, the management model must think about the environment that changes at any time. It is necessary to think about the uncertainty of the human's action and the law. It is not easy to use it in the society that changes at any time.

Then, first of all, the technique of the problem structuring is used in this research. This digs up the problem of the nursing service, and sees the incidence part of the problem. The concept of the problem structuring is to share the formulation of the problem. The same problem is different knowledge depending on the person. Kato understands the structure of the problem that the person is recognizing by the interview. And, the recognition maps of stakeholders are integrated into the problem structuring. The starting point of the problem structuring is the discussion among people with different recognition. Therefore, it is a tool for the consensus building. It can know a logical relationship between the provided service and the strategic target. Figure 4 shows the problem of the senior population's welfare policy. The author shows

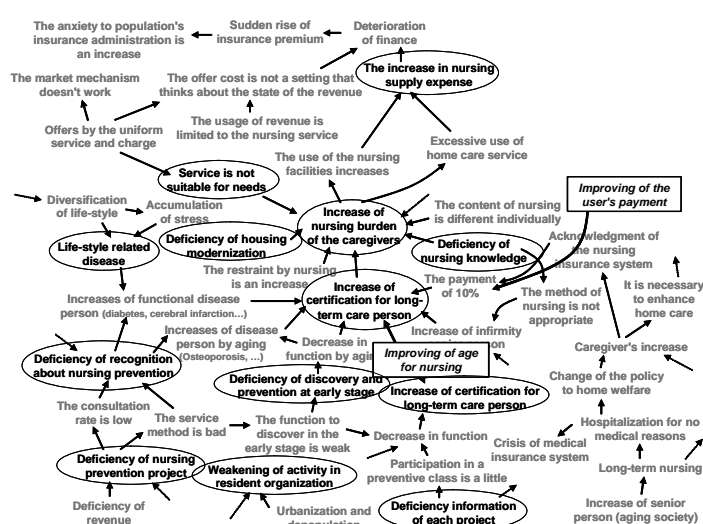


Figure5. Process of policy logic model

a part for the convenience of space.

The problem and the necessary target are written in Figure 4. There are the researches in the past and the hearing from entrepreneur who is providing service and care-manager in the base. I made Figure 4 by systematically through arranging each element based on the causal relation. Figure 4 visualizes the mechanism of the problem. A true cause of the problem can be found. The local government can consider measures against the cause. The problem has a lot of causes. However, the cause is usually a layered structure. A true cause is understood by investigating the cause from beginning to end. The approach of the problem structuring is good at not only the finding of true problem but also the planning of the policy.

### 3.2 The policy logic model's construction

Figure 4 has linked elements dug up by the causal relation. The element is a present target, an environment and an attribute. It is necessary to make the administrative management system. Therefore, the strategic target is clarified, and the policy necessary to achieve is linked with the target. This is

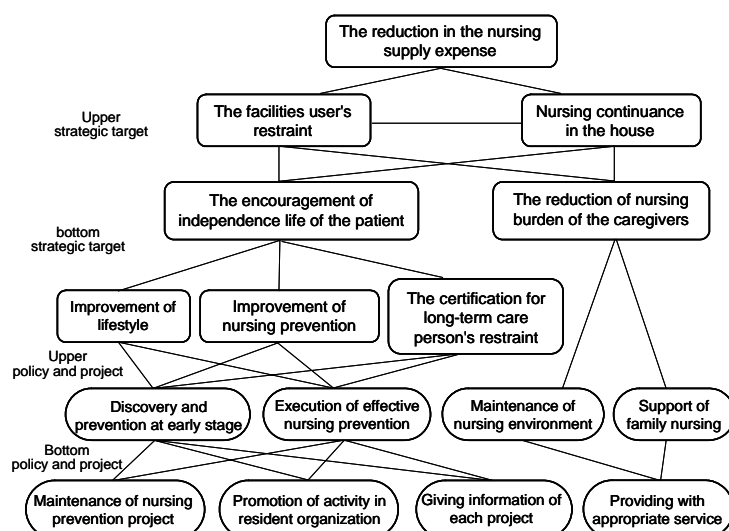


Figure6. Logical structure chart

called the policy logic model. The logic model is a logical model which the outcome and the output were shown. The outcome means the result of the project to the strategic target. The output is the project result of using management resources. The logic model functions as a management system tool of the confirmation and the review. But the logical model is composed of the environment that doesn't change. According to it has the possibility that not only the causal relation of element but also the logical structure changes. This means the change of the logical model that composes the management system. The shift procedure from the structure of the problem of Figure 4 to the policy logic model is shown. Figure 5 shows the process.

1. Present elements are linked by the causal relation (Figure 4).
2. The policy idea that thinks about extension of option is added (Figure 5).
3. The element of the environment and the attribute is removed.
4. The system of the problem is arranged to the hierarchy (Figure 6).

For example, the policy idea is the improvement of the user's payment and the age in which the service

can be received as an option of measures of the certification person increasing. The policy option is enclosed with the square in figure 5. And, the system of the frame of the policy logic model is done based on the structure of the problem. A concrete target is obtained by turning over the problem in the structure of the problem at that time. The problem; for example, "the increase of nursing burden of the caregivers" becomes "the reduction of nursing burden of the caregivers". The main problem is enclosed with the circle in figure 5. The element that turned over element enclosed with the circle becomes the element of the policy logic model. Figure 6 is the policy logic model of this research. The reduction of the nursing supply expense is the final outcome of the local government. The bottom outcome is the patient's independence and caregiver's reduction of incidence. Figure 6 shows a logical relationship to achieve the outcome efficiently and effectively.

There are many people engaged in the senior population's welfare policy. For instance, certification for long-term care person, caregivers, insurance person's local governments, insured person, entrepreneur who is providing service and care-manager. Thus, there are many stakeholders. Figure 6 is not a general mode, so it is "Logical structure chart". A more detailed problem structuring will be able to be get according to the part that the policy logic model cuts out. Figure 4 and Figure 6 are made from the whole image of the problem that the nursing supply expense increases. Reduction of nursing burden that is one of the outcomes is described in this paper. There is the problem structuring of the mechanism that the burden of nursing increases.

### **3.3 Structurizing of the burden of nursing**

#### **3.3.1 Research in the past of the feeling of burden by caregivers**

The outcome of reduction of nursing burden which is the feeling of burden by caregivers knows how much reduced by using the nursing service. It is necessary to understand the problem structuring of the mechanism that the burden of nursing for the find measures of the reduction of nursing burden. First, the author surveys the research of the past of the feeling of burden by caregivers.

The feeling of burden by caregivers is understood by using the Japanese Version of the Zarit Caregiver Burden Interview (J-ZBI) in the past research. The factor of the point of J-ZBI and the attribute is analyzed. This result is difficult to make it link with the policy to reduce the feeling of burden by caregivers. This attribution analysis is not dug up with the feeling of burden by caregivers recognized. Then, we clarify the structure which is the burden of nursing that individual caregivers are holding. We understand the reduction of nursing burden by using this structure. That is, we monitor the change of the structure of the nursing burden by the service use, and the outcome is get.

#### **3.3.2 The problem structuring of the nursing burden**

Nursing care has not only a negative side of burden but also an affirmative side of growth by nursing care. Actually, the author heard an affirmative side by nursing care in the hearing to the caregivers. The caregiver felt challenge by the family's member understanding and cooperation for the nursing care. The idea of the caregiver which is the nursing care is a chance of education to the grandchild. We did problem structuring of the feeling of burden by caregivers though the hearing, the nursing care experience, and the research in the past. The problem structuring of the feeling of burden by caregivers is

to dig up the effect of nursing service and the uneasiness of the caregivers. We make the mechanism that the burden of nursing cares. We can be understood both the policy to reduce nursing burden and the amount of reduction of nursing burden by using the nursing service. The factor to increase the burden of nursing cares is different among caregivers. It cannot explain the element that increase the burden of nursing cares only by the attribute and the use of nursing service. Recognition and the situation to the caregiver's nursing are related, too. The factors that increase the burden of nursing cares are different according to the patient's condition and the informalsaport. The explaining variable of the factor is the attribute and the use of nursing service. The problem structuring of the feeling of burden by caregivers was arranged as a structural model of the nursing burden (Figure 7). The structural model in Figure 7 is only an element that composes the burden of nursing.

The reduction of the nursing burden was an outcome. Fukushima is assumed that the nursing continuance is enabled by the reduction of the nursing burden in the house. The nursing continuance in the house decreases the number of users of the facilities service. The continuance of nursing connects to the reduction in the nursing supply expense in the house. Because the nursing a person supply expense of the facilities service is about three times those of the home-care service. Then, the nursing continuance was defined as an upper outcome in the house. This connects to the grasp of the outcome "Reduction in nursing supply expense" of the local government

#### 4. EFFECTIVENESS OF STRUCTURAL MODEL

The structural model in the question visualized it by the element that composed the burden of nursing. Here, the reduction of the nursing burden is an

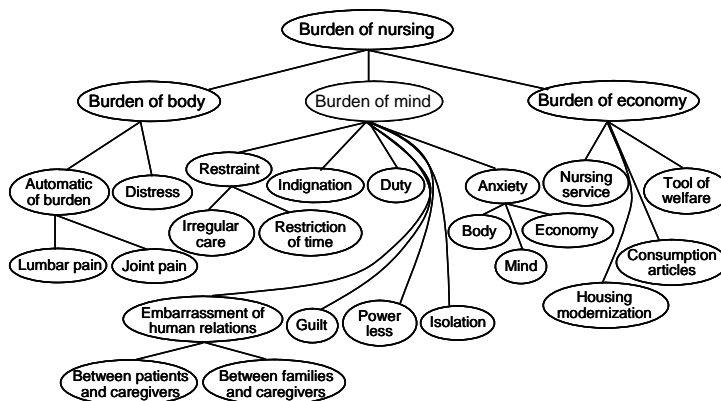


Figure7. Structural model of nursing burden

outcome. The preceding chapter described the reduction of the nursing burden is connection with the nursing continuance in the house, and the connection with the cost reduction in the entire administration This shows a part of the logical structure chart of Figure 6. From this chapter, The author is described that the operation method of considering the concept of the system maintenance by the structural model of the nursing burden (Figure 7).

#### 4.1 The structural model's analysis

The author understands the burden of nursing that individual caregivers are holding by the structural model. We are scheduling the questionnaire survey to the caregivers aiming to confirm the structural model. There are two kinds of questionnaires. One questionnaire aims to understand the problem structure and needs. Another one aims to make the relation of the element as a function. The policy option to have thought when shifting to the policy logic model is needed in making to the function. The policy option understands the population's reaction when there is a policy. The policy option enables the simulation in the plan. This paper describes the grasp of the problem structure and needs. The question on five stage evaluation is repeated for the structural model's each element about the burden that the



caregiver feels now. The purpose of the questionnaire is to quantify each element. The structural model in Figure 7 is modeling the caregivers. Structural model's each element is a factor to increase the burden of nursing. The structure model of the nursing burden is different with the caregiver's situation and patient's condition. Then, the author dug up the attribute related from the past research to the nursing burden. The questionnaire has these attribute and the amount of using the nursing service as the caregiver's interface.

The purpose of the questionnaire is to understand the problem structure and needs of the caregivers. It is a questionnaire based on the structural model. The relation between the attribute and the amount of using the nursing service and the burden of nursing can be quantified from the questionnaire. The caregiver's interface is analyzed as an explaining variable. The first stage of the analysis is an analysis only of a subjective evaluation of the caregiver. A subjective evaluation is an evaluation that used five stage evaluation result of each element. In this evaluation, it thinks about the attribute and the amount of using the nursing service. The evaluation purpose is demonstration of the structural model that constructed it. Next, we evaluate the structural model that considered the explaining variable of the attribute and the amount of using the nursing service. It can know the element of the burden of nursing that individual caregivers are holding. Therefore, we can understand needs that the caregiver is requesting. The local government can examine whether to consider the policy against caregiver's needs at the plan stage.

It is possible to monitor it by regularly executing the same questionnaire. The monitor can understand the conformational change depends on the change in the attribute and the amount of using the nursing service.

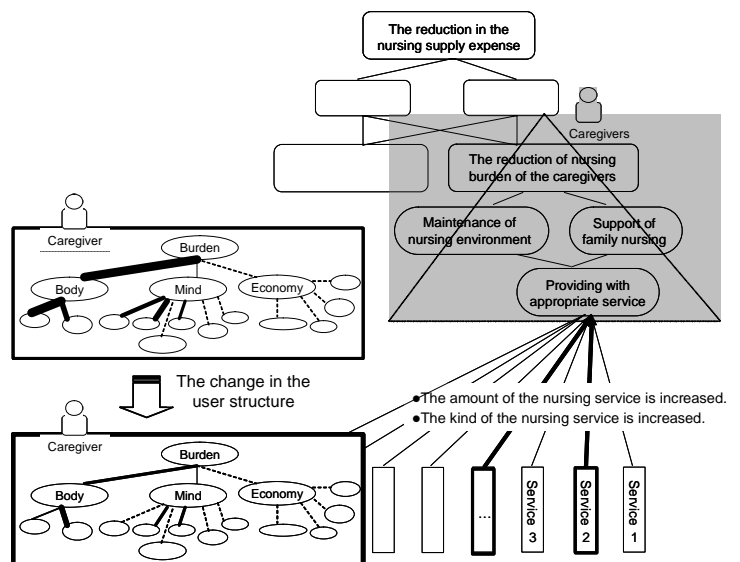


Figure8. Effectiveness of structure model

We are connecting the relation between the explaining variable and the structural mode. For example, the change in the user structure when the amount of the nursing service is increased is shown in Figure 8. The grasp of the conformational change can be used to plan and to evaluate the policy. Moreover, the structural model can be classified by each attribute. We can understand the effect structure by using the nursing service with the attribute classification as a unit. The effect structure makes the policy logical model quantitative. We can review the plan by monitoring the effect structure. This work is system maintenance.

## 4.2 Development in the future

The starting point of the problem structuring was the discussion among people with different recognition. And, it is a tool for the consensus building. The recognition of the problem is different among stakeholders. The caregiver is aiming at the reduction of the nursing burden while using the nursing service. The patient is aiming at the independence of life on the other hand. The author learnt nursing that make a point of keeping an eye on the patient was important in the nursing practice.

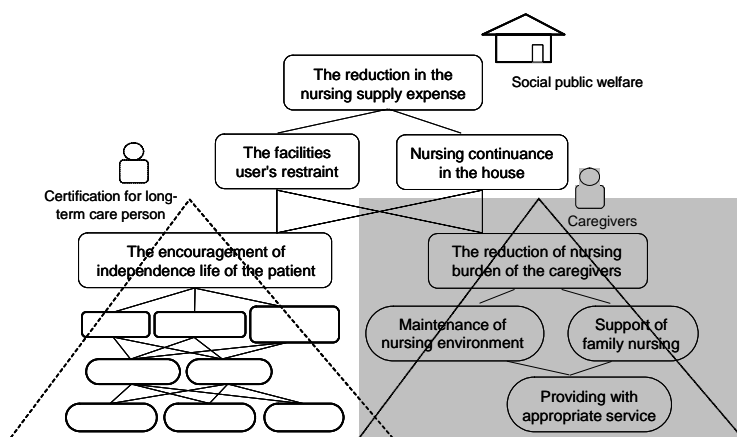


Figure9. Optimization of the administration (policy logic model)

Even if it takes a lot of time, the caregiver should keep an eye on the patient. It is demanded that the caregiver keep an eye on the patient for the patient's independence. But the act of keeping an eye on the patient is the restraint of time and the mental burden for the caregiver. That is, the burden of nursing increases. Even if the feeling of burden by caregivers increases, keeping an eye on the patient is connected with the patient's independence. The caregivers will get into the dilemma.

The problem in the future is how it optimizes the trade-off relation between the caregivers and the patient (Figure 9). The solution of this problem means the management model by which the outcome is considered. In this paper the outcome is the reduction of nursing burden of the caregivers and the encouragement of independence life of the patient. Two outcomes are the bottom outcomes (the bottom strategic target) of Figure 6. This management model means the construction of the system in the entire logical structure chart. The optimal solution for two outcomes is an optimal solution for a upper outcome. In other words, a social public welfare is obtained.

## 5. THE END

The purpose of this research is a methodology of the

decision making that does the policy selection that population's effect becomes the maximum in the limited budget. We described the methodology that understood how the nursing burden had been reduced by using the nursing service in this paper. The author will understand the evaluation function from the questionnaire in the future. And, I want to find the optimal solution in the trade-off relation between the caregiver and the patient. The optimal solution means the policy selection that population's effect becomes the maximum in the limited budget. Therefore, it is important that the evaluation function composed of explaining variable of the attribute and the environment. The function of the system maintenance has been provided for the system. The idea of the system maintenance is important when the society is changed

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